

What is claimed is:

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1. An ink-jet recording sheet comprising a first porous layer at the outermost position of the ink-jet recording sheet, wherein the ink-jet recording sheet satisfies the following Formula (1), when an aqueous solution, which comprises a water-soluble alcohol-type organic solvent having an SR value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of not less than 120 °C in an amount of from 10 to 40% by weight, is provided to the surface of the ink-jet recording sheet in an amount of 20 ml/m<sup>2</sup>,

Formula (1)

$$Vc/Vd \leq 0.4$$

wherein Vc represents a water transition amount of a first area of the ink-jet recording sheet, where the aqueous solution is provided, during a contact time of 0.8 seconds when the first area is subjected to Bristow's Measurement, and Vd represents a water transition amount of a second area of the ink-jet recording sheet, where the aqueous solution is not provided, during a contact time of 0.8 seconds when the second area is subjected to Bristow's Measurement.

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2. The ink-jet recording sheet of Claim 1, wherein the ink-jet recording sheet further satisfies the following Formula (2),

$$\text{Formula (2)} \quad v_{60}/v_d \geq 0.7$$

$v_d$  represents a water transition amount of the ink-jet recording sheet during a contact time of 0.8 second when the ink-jet recording sheet is subjected to Bristow's Measurement after being stored at 60 °C and 20 RH for 24 hours.

3. The ink-jet recording sheet of Claim 1, wherein the first porous layer comprises a water-insoluble organic fine particles, which is capable of being dissolved in or swelled by a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of 120 °C or more, as a primary component, and the ink-jet recording sheet further comprises a second porous layer comprising inorganic fine particles and a hydrophilic binder as a primary component.

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4. The ink-jet recording sheet of Claim 3, wherein a mean primary diameter of the water-insoluble organic fine particles is not more than 0.1  $\mu\text{m}$ .
  5. The ink-jet recording sheet of Claim 3, wherein the ink-jet recording material comprises a non-water-absorptive support.
  6. The ink-jet recording sheet of Claim 1, wherein the water-soluble alcohol type organic solvent is diethylene glycol monobutyl ether.
  7. The ink-jet recording sheet of Claim 6, wherein the first porous layer comprises water-insoluble organic fine particles, which is capable of being dissolved in or swelled by diethylene glycol monobutyl ether, as a primary component, and a mean primary diameter of the water-insoluble organic fine particles is not more than 0.1  $\mu\text{m}$ .
  8. The ink-jet recording sheet of Claim 6, wherein the ink-jet recording sheet comprises a non-water-absorptive support.

9. The ink-jet recording sheet of Claim 1, wherein the first porous layer comprises organic fine grains as a primary component.

10. The ink-jet recording sheet of Claim 1, wherein the ink-jet recording sheet comprises a non-water-absorptive support.

11. An ink-jet recording sheet comprising an ink-absorbing layer having a first porous layer at the outermost position of the ink-absorbing layer, wherein the ink-absorbing layer comprises water-insoluble organic fine particles which is capable of being dissolved in or swelled by a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of not less than 120 °C.

12. The ink-jet recording sheet of Claim 11, wherein the first porous layer comprises the water-insoluble organic fine particles as a primary component.

13. The ink-jet recording sheet of Claim 12, wherein the ink-absorbing layer comprises a second porous layer contains inorganic fine particles and a hydrophilic binder as a primary component, and a thickness of the first porous layer is not more than 20% of the entire ink-absorbing layer and a thickness of the second porous layer is not less than 80% of the entire ink-absorbing layer.

14. An ink-jet recording method comprising steps of jetting an ink having a water-soluble dye, water and water soluble organic solvent onto an ink-jet recording sheet comprising a first porous layer at the outermost position of the ink-jet recording sheet in an amount of 10 to 35 ml/m<sup>2</sup>, and drying the at room temperature until reaching a constant state, wherein the ink and the ink-jet recording sheet satisfy the following Formula (3),

$$\text{Formula (3)} \quad V_a/V_b \leq 0.4$$

wherein Va represents a water transition amount of a first area of the ink-jet recording sheet, where the ink is provided in said amount, during a contact time of 0.8 seconds when the first area is subjected to Bristow's Measurement, and Vb represents a water transition amount

of a second area of the ink-jet recording sheet, where the ink is not provided, during a contact time of 0.8 seconds when the second area is subjected to Bristow's Measurement.

15. The ink-jet recording method of Claim 14, wherein the water-soluble organic solvent is a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of 120 °C or more, and the first porous layer comprises a water-insoluble organic fine particles which is capable of being dissolved in or swelled by the water-soluble alcohol-type organic solvent.

16. The ink-jet recording method of Claim 15, wherein the water-soluble alcohol-type organic solvent is triethylene glycol monobutyl ether.

17. An ink-jet recording method of jetting an ink comprising a water-soluble dye, water and a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of not

less than 120 °C onto an ink-jet recording sheet comprising a first porous layer at the outermost position of the ink-jet recording sheet, wherein the first porous layer contains a water-insoluble organic fine particles, which is capable of being dissolved in or swelled by the water-soluble alcohol-type organic solvent, as a primary component.

18. The ink-jet recording method of Claim 17, wherein the water-soluble alcohol-type organic solvent is triethylene glycol monobutyl ether.

19. A method for preparing the ink-jet recording sheet of Claim 1 comprising steps of coating a coating solution comprising an organic fine particle emulsion, which satisfies the following Formula 4, and drying the coated solution,

$$\text{Formula (4)} \quad T_0 \geq 60 \text{ and } T_{20} \leq 10$$

wherein  $T_0$  is a minimum film forming temperature (in °C) of the organic fine particle emulsion and  $T_{20}$  is the minimum film forming temperature (in °C) of the organic fine particle emulsion when a hydrophilic organic solvent

~~is added to the organic fine particles emulsion in and amount of 20 percent by weight of the organic fine particle emulsion.~~